

REMARKS

Claims 1, 4-6, and 14 have been amended, and claims 6, 8, and 70 have been cancelled. Accordingly, claims 1-5, 7, 9-46, 49-53, 65-69, 71-77, and 79-81 are pending in the present application. The claim amendments are supported by the specification and claims as originally filed, with no new matter being added. Claims 4-6 and 14 have been amended to provide terminology consistent with amended claim 1. Accordingly, favorable reconsideration of the pending claims is respectfully requested.

1. Rejections Under 35 U.S.C. § 112

Claims 4 and 5 were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter not adequately described in the specification to enable one skilled in the art to make and/or use the invention, for the reasons set forth on pages 2-3 of the Office Action. Claim 4 was also rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for the reasons set forth on page 3 of the Office Action. Applicants respectfully traverse.

The Examiner indicates that the specification fails to teach how a refraction pattern, a corner cube reflector, or moiré pattern as recited in claim 4 are capable of providing optical interference. It is known by those skilled in the art that if a corner cube reflector has dimensions near that of a wavelength of light, then diffractive effects (caused by light interference) occur. Also, in the case of a moiré pattern, two nearly identical patterns embossed together, but off-set from one another, will form a moiré type interference pattern if the line/spacing is on the order of wavelengths of light. (A "refraction pattern" is a general term used to describe diffractive type surfaces.)

Further, Applicants note that claim 4 depends from claim 1, which has been amended to recite that the first surface has an “optical structure thereon”. All of the elements recited in claim 4 are optical structures. Thus, claim 4 is not indefinite.

Claim 5 has been amended to recite that the optical structure is selected from “composite holograms with changing imagery as the angle of view is changed” as suggested by the Examiner.

Accordingly, Applicants respectfully request that the rejection of claims 4-5 under 35 U.S.C. § 112 be withdrawn.

2. Rejections Under 35 U.S.C. § 103

Claims 1-6, 14, and 79 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,700,550 to Uyama et al. (hereinafter “*Uyama*”) for the reasons set forth on pages 3-4 of the Office Action. Applicants respectfully traverse.

Uyama discloses a transparent hologram seal structure that has an alternating high and low index optical stack (transparent evaporated layer 10) on a hologram forming layer 4 (col. 5 line 20). The hologram forming layer is a discrete polymeric layer (col. 5, lines 46-54) and the material used for this layer is one that “can be used to stably form a hologram image” such as a relief type hologram image (col. 5, lines 54-56).

As the Examiner admits, *Uyama* does not teach that transparent evaporated layer 10 is formed at an opposite surface of base member 2 from where the relief surface of the hologram is formed. In fact, there is no teaching or suggestion in *Uyama* of where the hologram image is with respect to transparent evaporated layer 10. Nevertheless, it must be assumed that the hologram relief surface is next to layer 10, since the high index layer 6 of layer 10 is next to the

hologram forming layer 4. Otherwise, the hologram would be practically invisible since *Uyama* discloses a transmissive structure. Also, there would be no opaque aluminum in the hologram relief structure as is common with relief holograms in order to render them visible, since *Uyama* discloses a transmissive structure. Thus, only by putting the relief surface next to the high index layer would the hologram be visible. If the relief surface was next to base layer 2 in the structure of *Uyama*, the hologram would essentially disappear due to index matching of the base layer 2 with hologram forming layer 4.

Thus, there would have been no motivation for modifying the structure of *Uyama* such that the hologram relief surface would be on the side of a substrate opposite from a color shifting optical coating as recited in present claim 1. Such a modification of the structure of *Uyama* would destroy its intended function in providing a visible hologram to prevent forgery.

In the presently claimed invention, the optical coating is on the opposite side of the transmissive substrate from the optical structure such as a hologram. Such a configuration results in a much different and unique optical effect - a hologram viewed at one angle and other colors displayed at other viewing angles. The observer sees a holographic image at one viewing angle without any color shifting effects being seen. At all other viewing angles, the observer sees changing colors as the device is rotated due to the interference color shifting effects coming into play without observation of the hologram.

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Independent claim 79 recites similar features as claim 1, including a light transmissive substrate having a first surface and an opposing second surface, with the first surface having an optical interference pattern, and a color shifting optical coating on the second surface of the substrate. As discussed above with respect to claim 1, there would have been no motivation for

modifying the structure of *Uyama* such that the hologram relief surface would be on the side of a substrate opposite from a color shifting optical coating, as recited in present claim 79.

Accordingly, for the above reasons, claims 1 and 79 would not have been obvious over *Uyama*. Claims 2-6 and 14 depend from claim 1, and thus include the limitations thereof. Hence, claims 2-6 and 14 would not have been obvious over *Uyama* for at least the same reasons as discussed above for claim 1. Applicants therefore respectfully request that the rejection of claims 1-6, 14, and 79 under 35 U.S.C. § 103(a) be withdrawn.

Claims 7 and 8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Uyama* in view of U.S. Patent No. 4,930,866 to Berning et al. (hereinafter “*Berning*”) for the reasons set forth on page 5 of the Office Action. Applicants respectfully traverse.

Berning discloses a combination of a reflector/dielectric/absorber optical stack 14 in combination with a colored superstrate 13. The colored superstrate is used in a subtractive mode to cause a modification of the normal incidence gold color and color shift with angle properties as seen in reflection. The Examiner asserts that it would have been obvious to apply the teachings of *Berning* to modify the transparent evaporated layer 10 of *Uyama* to provide a color shifting layer according to *Berning*. Applicants respectfully disagree.

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Since *Uyama* discloses a transmissive structure, there would have been no motivation to substitute the color shifting optical stack of *Berning* (non-transmissive/reflective) for the transparent evaporated layer 10 of *Uyama*. Such a modification of the structure of *Uyama* would destroy its intended function of providing a transmissive structure.

Accordingly, claims 7 and 8 would not have been obvious over *Uyama* in view of *Berning*. Applicants therefore respectfully request that the rejection of claims 7 and 8 under 35 U.S.C. § 103(a) be withdrawn.
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Claim 80 was rejected under 35 U.S.C. § 103(a) as being unpatentable over *Uyama* in view of *Berning* for the reasons set forth on pages 5-6 of the Office Action. Applicants respectfully traverse.

Claim 80 recites a light transmissive substrate having a first surface and an opposing second surface, with the first surface having an optical interference pattern, and a color shifting optical coating on the second surface of the substrate. The optical coating includes an absorber layer on the second surface of the substrate, a dielectric layer on the absorber layer, and a reflector layer on the dielectric layer.

The Examiner asserts that it would have been obvious to apply the teachings of *Berning* to modify the transparent evaporated layer 10 of *Uyama* to provide a color shifting layer according to *Berning*. Applicants respectfully disagree.

As discussed above, since *Uyama* discloses a transmissive structure, there would have been no motivation to substitute the color shifting optical stack of *Berning* (non-transmissive/reflective) for the transparent evaporated layer 10 of *Uyama*. Such a modification of the structure of *Uyama* would destroy its intended function of providing a transmissive structure.

Accordingly, claim 80 would not have been obvious over *Uyama* in view of *Berning*. Applicants therefore respectfully request that the rejection of claim 80 under 35 U.S.C. § 103(a) be withdrawn.

Claims 66-68, 70, 76, 77, and 81 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Berning* in view of *Uyama* for the reasons set forth on pages 6-7 of the Office Action. Applicants respectfully traverse.

Independent claim 66 is directed to a hot stamp structure for use in attaching a security article to an object, and recites a light transmissive substrate on a release layer, the substrate having an optical interference pattern thereon, and a color shifting optical coating on the substrate. Independent claim 81 is similar to claim 66, and further recites that the optical coating includes an absorber layer, a dielectric layer adjacent to the absorber layer, and a reflector layer adjacent to the dielectric layer.

The Examiner asserts that it would have been obvious to apply the teachings of *Uyama* to modify the thin film optically variable article of *Berning* to include a hologram within the substrate (superstrate). Applicants respectfully disagree.

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As discussed above, *Uyama* discloses a transmissive structure, whereas *Berning* discloses a thin film article that is non-transmissive/reflective. Since the *Uyama* structure is transmissive, it is dependent on the underlying color of the substrate to which it is applied. In the case of a white paper substrate, very little of the color shifting properties will be seen when the *Uyama* transmissive structure is applied thereto. The transmitted light will be reflected back through the hologram, rendering almost no effect since the transmitted light will combine with the reflected light to produce, at best, a faint outline of the color shift and the holographic features. In contrast, the structure of *Berning* has optical properties that are produced by combining properties of optical stack 14, which is reflective, with colored superstrate 13. Hence, unlike the *Uyama* structure, the *Berning* structure is not dependent on the underlying color of the substrate to which it is applied. Thus, there would have been no motivation to combine the teachings of *Berning* and *Uyama*.

Accordingly, for the above reasons, claims 66 and 81 would not have been obvious over *Berning* in view of *Uyama*. Claims 67, 68, 70, 76, and 77 depend from claim 66, and thus

include the limitations thereof. Hence, claims 67, 68, 70, 76, and 77 would not have been obvious over *Berning* in view of *Uyama* for at least the same reasons as discussed above for claim 66. Applicants therefore respectfully request that the rejection of claims 66-68, 70, 76, 77, and 81 under 35 U.S.C. § 103(a) be withdrawn.

3. Double Patenting

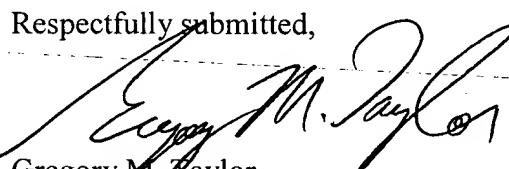
The Examiner indicated that claims 6, 8, and 70 are substantially duplicated by claims 79, 80, and 81. As claims 6, 8, and 70 have been cancelled, the potential double patenting rejection is now moot.

CONCLUSION

In view of the foregoing, Applicants respectfully request favorable reconsideration and allowance of the present claims. In the event there remains any impediment to allowance of the claims, which could be clarified in a telephone interview, the Examiner is respectfully requested to contact the undersigned attorney.

Dated this 14th day of June 2002.

Respectfully submitted,


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VERSION WITH MARKINGS TO SHOW THE CHANGES MADE

IN THE CLAIMS:

Claims 1, 4-6, and 14 have been amended as follows:

1. (Once Amended) A security article comprising:

a light transmissive substrate having a first surface and an opposing second surface, the first surface having an optical structure thereon [interference pattern];
a color shifting optical coating on the second surface of the substrate, the optical coating providing an observable color shift as the angle of incident light or viewing angle changes; and
an adhesive layer on the optical coating.

4. (Once Amended) The security article of claim 1, wherein the optical structure [interference pattern] is selected from the group consisting of a diffraction grating pattern, refraction pattern, holographic image pattern, corner cube reflector, zero order diffraction pattern, moiré pattern, and combinations thereof.

5. (Twice Amended) The security article of claim 1, wherein the optical structure [interference pattern] is selected from the group consisting of [a hologram] composite holograms with changing imagery as the angle of view is changed, and a hologram with multiple holographic pixels arranged in a spatial orientation that generates one holographic image.

6. (Once Amended) The security article of claim 1, wherein the optical structure [interference pattern] is a light interference pattern based on microstructures having dimensions of from about 0.1 μm to about 10 μm .

14. (Once Amended) The security article of claim 1, wherein the combination of the optical structure [interference pattern] and the color shifting optical coating produce unique colors with viewing angle changes not achievable with either the optical structure [interference pattern] or the color shifting optical coating alone.